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TITLE OF INVENTION	
54	DECODER WITH MULTIPLE CONDITIONAL ACCESS FACILITY

57	ABSTRACT (NOT MORE THAN 150 WORDS)	NUMBER OF PAGES	18
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## ABSTRACT

A decoder 10 for encoded broadcast services comprises at least first and second entitlement control units 18 and 20 associated with a first and a second conditional access system for respectively protecting broadcast services. The decoder further comprises an embedded descrambler 22 for descrambling a scrambled input transport stream. A central controller 11 executes under control of a conditional access management system 26 either a first conditional access manager application 28 or a second conditional access manager application 30. The first manager application is operative to cause the descrambler 22 in conjunction with deciphering key data received from the first unit 18 to descramble services protected by the first system, alternatively in conjunction with data received from the second unit 20 to descramble services protected by the second system.

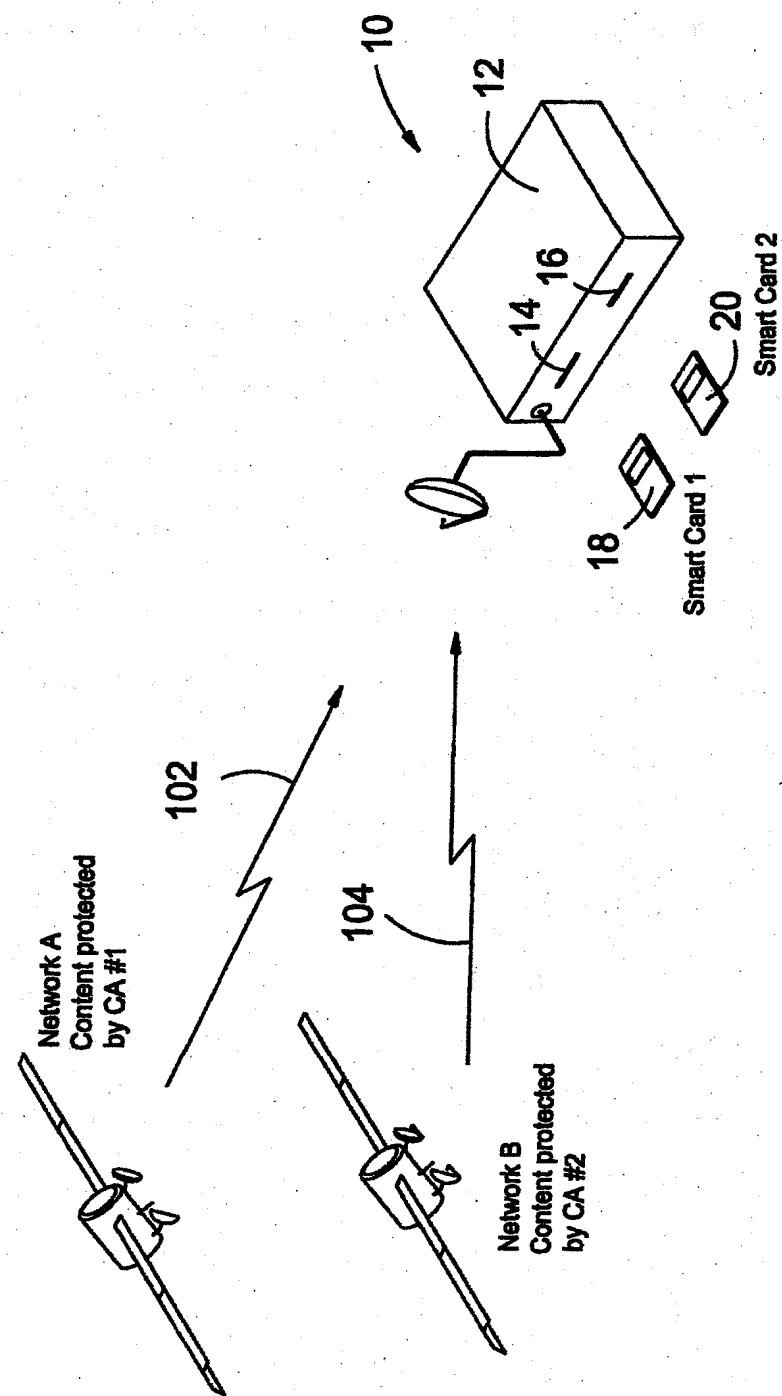


FIGURE 2

## INTRODUCTION AND BACKGROUND

THIS invention relates to decoders for encoded television services. It more particularly relates to such decoders providing conditional access to certain broadcast services.

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Conditional access (CA) systems for making broadcast services available to certain end users only are well known in the art. Normally such systems are utilized to make pay television services available to paying subscribers only. Decoders providing conditional access to the services of more than 10 one network or provider of services are also known. Such a known decoder comprises a set-top box defining a plurality of slots for removably receiving conditional access modules (CAM's). Each of the separate hardware CAM's comprises a dedicated descrambler. A smart card associated with the services of a particular provider may be used with the 15 CAM. Hence, a user would acquire a respective CAM and card associated with each provider of services that he would want access to and plug these into the aforementioned slots. The main disadvantage of this known system is that there is an unnecessary duplication of hardware components in the plurality of CAM's and hence the system is unnecessarily expensive.

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## OBJECT OF THE INVENTION

Accordingly it is an object of the present invention to provide a decoder and method with which the applicant believes the aforementioned disadvantages may at least be alleviated.

## 5 **SUMMARY OF THE INVENTION**

According to the invention there is provided a decoder for encoded broadcast services, the decoder comprising:

- a housing;
- at least first and second entitlement control units associated with respective at least first and second conditional access systems for protecting broadcast services;
- a descrambler system embedded in the housing for descrambling a scrambled input transport stream;
- a central controller executing under control of a multiple conditional access management system one of at least a first conditional access manager application and a second conditional access manager application;
- the first manager application being operative to cause the descrambler in conjunction with data received from the first entitlement control unit to descramble services protected by the first system, alternatively in conjunction with data received from the second entitlement control unit to descramble services protected by the second system.

The first and second entitlement control units may be removably receivable in the housing. Each of the first and second entitlement control units may comprise a smart card only.

5 The descrambler system may comprise a first part cooperating with the first entitlement control unit and a second part cooperating with the second entitlement control unit.

10 The multiple conditional access management system preferably comprises a multiple conditional access management application for running on the central controller.

15 A hard disc drive may be located in the housing. Data received by the decoder including transport stream data may be routed to the hard disc drive.

20 Also included within the scope of the invention is a method of providing conditional access to broadcast services protected by one of at least a first conditional access system and a second conditional access system, the method comprising the steps of:

- broadcasting at least services protected by the first conditional access system;

utilizing a central controller in a set-top box executing a multiple conditional access management application for managing at least a first conditional access manager application and a second conditional access manager application selectively to enable the first conditional access manager application;

5 enabling a first entitlement control unit to provide data for use in descrambling the services protected by the first conditional access system; and

utilizing a descrambler embedded in the set-up box, the enabled first 10 conditional access manager application with said data to descramble the services protected by the first conditional access system, thereby to make them available in human perceptible form.

#### **BRIEF DESCRIPTION OF THE ACCOMPANYING DIAGRAMS**

15 The invention will now further be described by way of example only, with reference to the accompanying diagrams wherein:

figure 1 is a block diagram of a prior art decoder for encoded television services comprising a prior art multiple conditional access system;

20 figure 2 is a basic block diagram of a decoder according to the invention comprising a multiple, more particularly dual conditional access system according to the invention;

figure 3 is a more detailed block diagram of the decoder according to the invention wherein services of a first provider or network are protected by a first conditional access system and services of a second provider or network are protected by a second conditional access system;

figure 4 is a diagram similar to that of figure 3 wherein services of a first provider are protected by both a first and a second conditional access system; and

figure 5 is yet another similar diagram illustrating an alternative embodiment of a descrambler forming part of the decoder.

## **DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION**

A decoder according to the invention for encoded television services comprising a multiple, preferably dual conditional access (CA) system according to the invention, is generally designated by the reference numeral 10 in figures 2 to 5.

On the other hand, the system 100 shown in figure 1 is a prior art system of the kind referred to in the introduction of the specification. Services from networks or providers A and B of services are shown at 102 and 104 respectively. A set-top box 106 used with this system encloses a decoder (not shown) and defines slots 108 and 110. Each slot is configured removably to receive a hardware conditional access module (CAM). Hence,

CAM 112 with dedicated CA deciphering or descrambling hardware and an associated smart card 114 which is configured to provide conditional access in human perceptible form to at least certain services of network A, is removably receivable in slot 108. Similarly, CAM 116 with similar dedicated hardware and associated smart card 118 which is configured to provide conditional access to at least certain of the services of network B, is removably receivable in slot 110. The unnecessary hardware duplication in these CAM's is referred to in the introduction of this specification.

10 Referring now to figures 2 and 3, in the decoder 10 according to the invention, the CAM's are dispensed with. The set-top box or housing 12 defines at least first and second slots 14 and 16 for removably receiving entitlement control units in the form of smart cards 18 and 20 respectively, only. Smart card 18 is configured in known manner to provide conditional access to at least certain services of network A and smart card 20 is configured to provide conditional access to at least certain services of network B, to make them available in human perceptible form via a television set (not shown) with which the set-top box is associated in known manner.

20 In the box 12 of decoder 10 according to the invention there is provided an embedded hardware DVB CA descrambler 22. The descrambler 22 deciphers the encoded transport stream for further processing at 24. A

common master or central controller 11 of the decoder executes under control of a multiple, typically dual CA management application or system 26 either a first CA manager application program 28 or a second CA manager application program 30. The first CA manager application 28, in conjunction with deciphering key data received from smart card 18 in response to entitlement messages broadcast from a head-end by provider A, enables the common descrambler 22 to decipher services of network A. Alternatively, second manager application 30, in conjunction with deciphering key data received from smart card 20 in response to entitlement messages broadcast from a head-end by provider B, enables common descrambler 22 to decipher services of network B.

The management system 26 changes dynamically between first manager application 28 and second manager application 30. If the set-top box 12 is required to have access to services of first network A, then the management system 26 disables second CA manager program 30 and causes the controller 11 to execute first CA manager program 28, and visa versa. This switching may be triggered by events such as: the absence of entitlements for smart card 20; and the presence of entitlements for smart card 18; and user inputs. Electrical power supplied to smart card readers (not shown) housed in the box 12 and for reading smart cards 18 and 20 need not be switched on and off and preferably are not switched to effect the aforementioned selection between the conditional access systems.

The decoder 10 may further comprise a hard disc drive (HDD) 32 located in the box 12. Amongst other uses, the HDD 32 serves to store selected parts of an encrypted transport stream. Upon play-back, the stored stream is descrambled by the embedded descrambler 22.

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In figure 4 there is shown a decoder 10 configured to decode a first suite of services of network A which is protected by a first conditional access system CA#1 and a second suite of services of the same network which is protected by a second conditional access system CA#2. The suites may be different or may have at least some common services. The operation of the decoder is similar to that described hereinbefore.

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In figure 5 there is shown a decoder 10 wherein the embedded descrambler 22 comprises a first part 22.1 and second part 22.2. The first part 22.1 cooperates with smart card 18 to descramble services protected by a first conditional access system CA#1 and the second part 22.2 cooperates with smart card 20 to descramble services protected by a second conditional access system CA #2.

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It will be appreciated that there are many variations in detail on the decoder and method according to the invention without departing from the scope and spirit of the appended claims.

**CLAIMS:**

1. A decoder for encoded broadcast services, the decoder comprising:
  - a housing;
  - at least first and second entitlement control units associated with respective at least first and second conditional access systems for protecting broadcast services;
  - a descrambler system embedded in the housing for descrambling a scrambled input transport stream;
  - a central controller executing under control of a multiple conditional access management system one of at least a first conditional access manager application and a second conditional access manager application;
  - the first manager application being operative to cause the descrambler in conjunction with data received from the first entitlement control unit to descramble services protected by the first system, alternatively in conjunction with data received from the second entitlement control unit to descramble services protected by the second system.
2. A decoder as claimed in claim 1 where the first and second entitlement control units are removably receivable in the housing.

3. A decoder as claimed in claim 1 or claim 2 wherein each of the first and second entitlement control units comprises a smart card.
4. A decoder as claimed in any one of claims 1 to 3 wherein the descrambler system comprises a first part cooperating with the first entitlement control unit and a second part cooperating with the second entitlement control unit.
5. A decoder as claimed in any one of the preceding claims wherein the multiple conditional access management system comprises a multiple conditional access management application for running on the central controller.
6. A decoder as claimed in any one of the preceding claims comprising a hard disc drive located in the housing.
7. A method of providing conditional access to broadcast services protected by one of at least a first conditional access system and a second conditional access system, the method comprising the steps of:
  - broadcasting at least services protected by the first conditional access system;

utilizing a central controller in a set-top box executing a multiple conditional access management application for managing at least a first conditional access manager application, and a second conditional access manager application selectively to enable the first conditional access manager application;

enabling a first entitlement control unit to provide data for use in descrambling the services protected by the first conditional access system; and

utilizing a descrambler embedded in the set-up box, the enabled first conditional access manager application with said data to descramble the services protected by the first conditional access system, thereby to make them available in human perceptible form.

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8. A decoder for encoded broadcast signals substantially as herein described with reference to figures 2 to 5.

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9. A method of providing conditional access to broadcast services substantially as herein described with reference to figures 2 to 5.

Dated this 5 day of June 2002

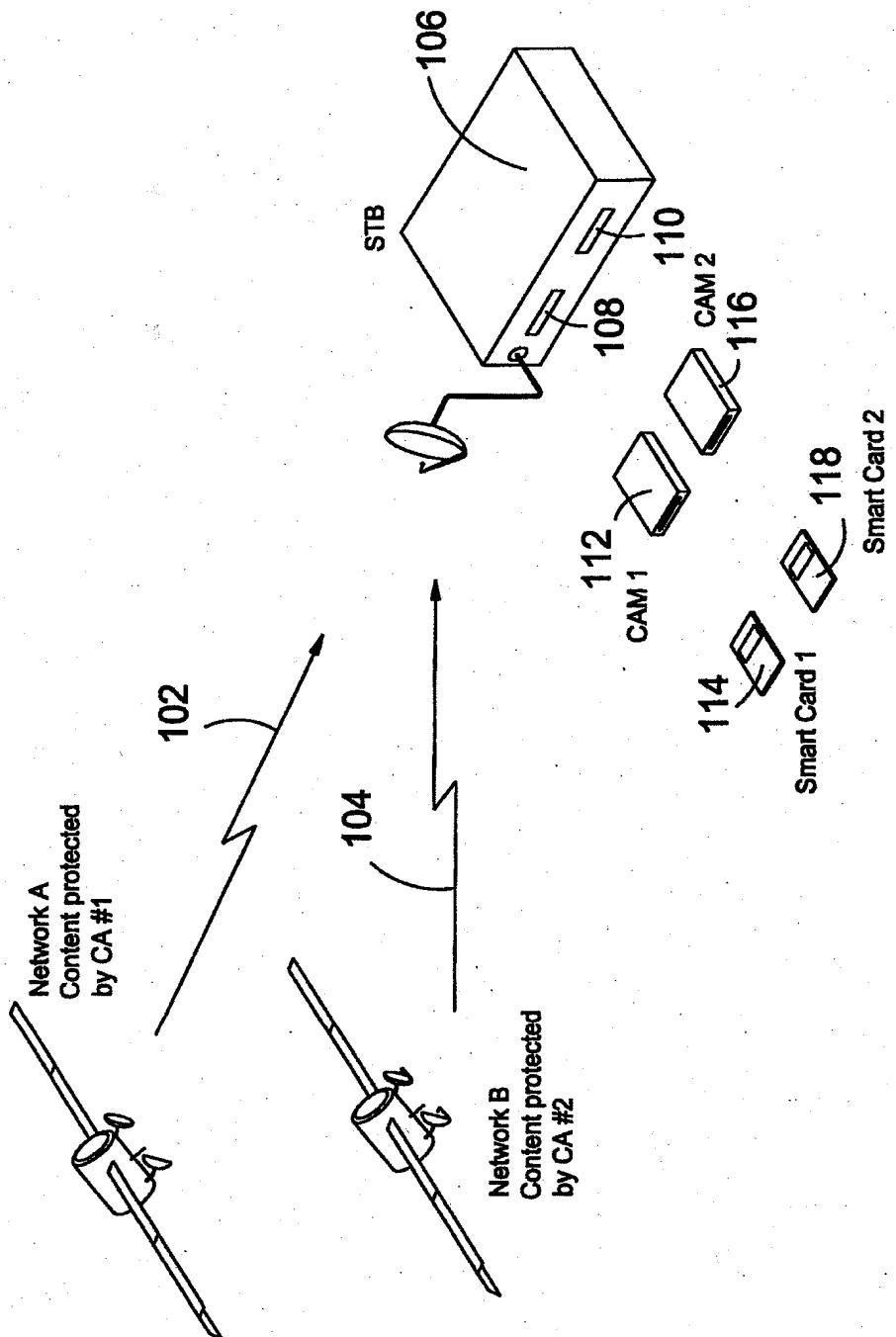


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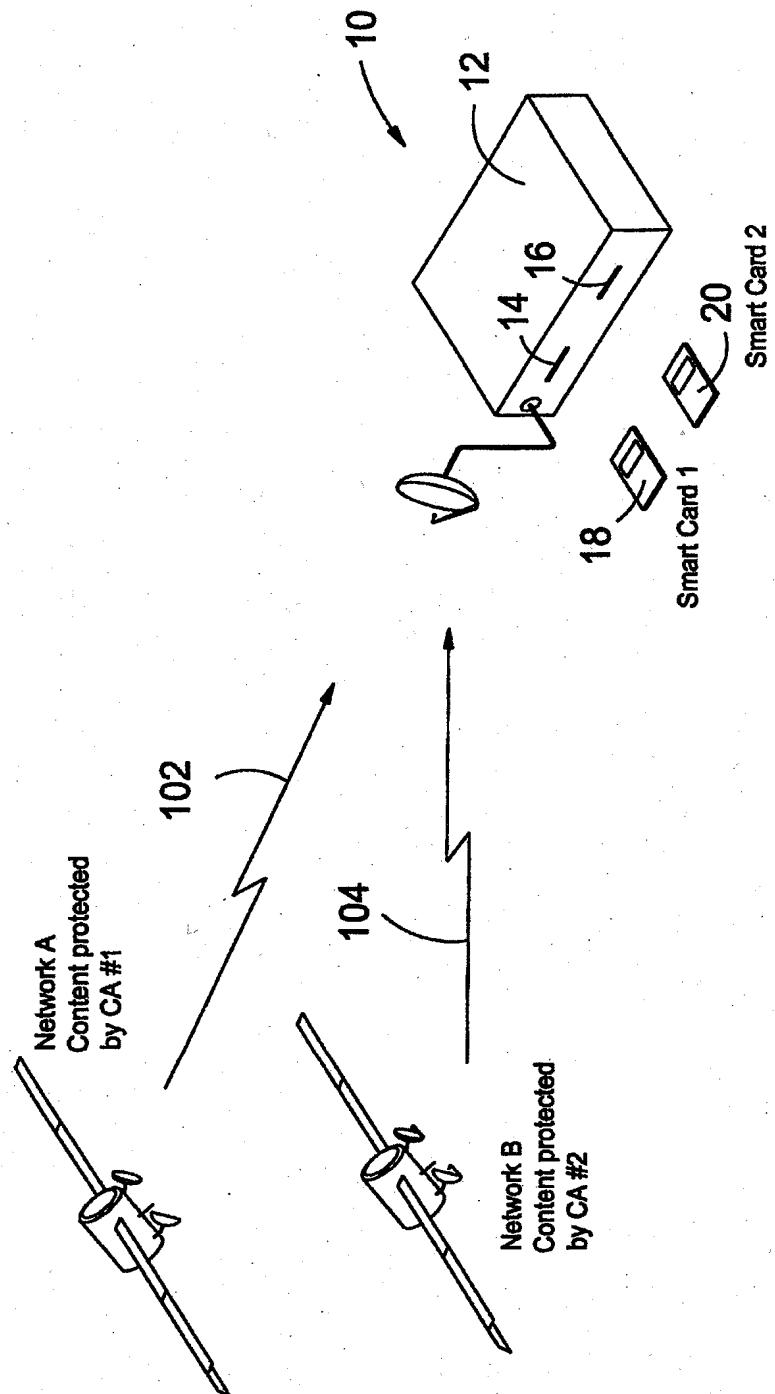
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Sheet 1



**FIGURE 1(PRIOR ART)**

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Sheet 2FIGURE 2

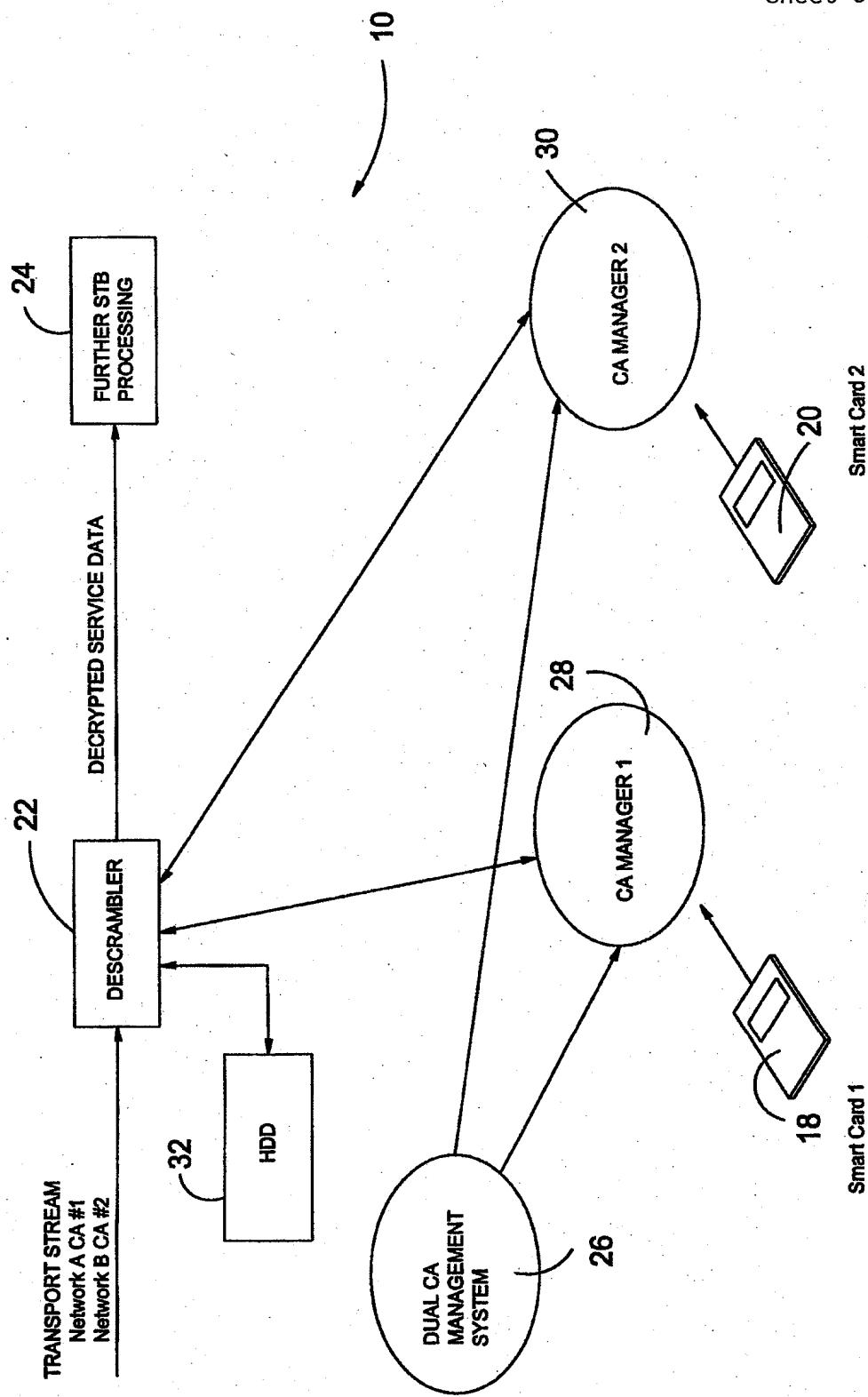
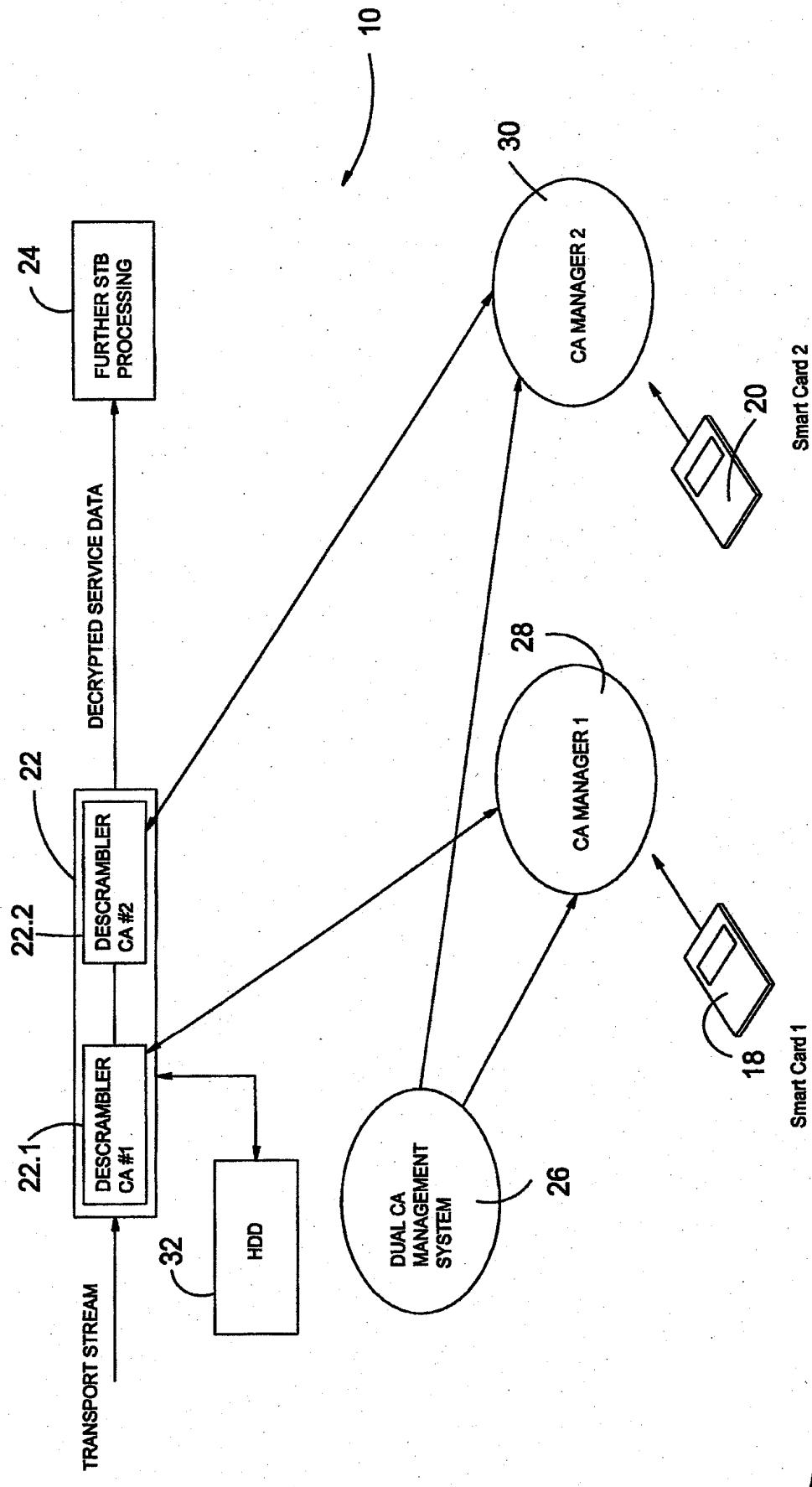


FIGURE 3

FIGURE 5

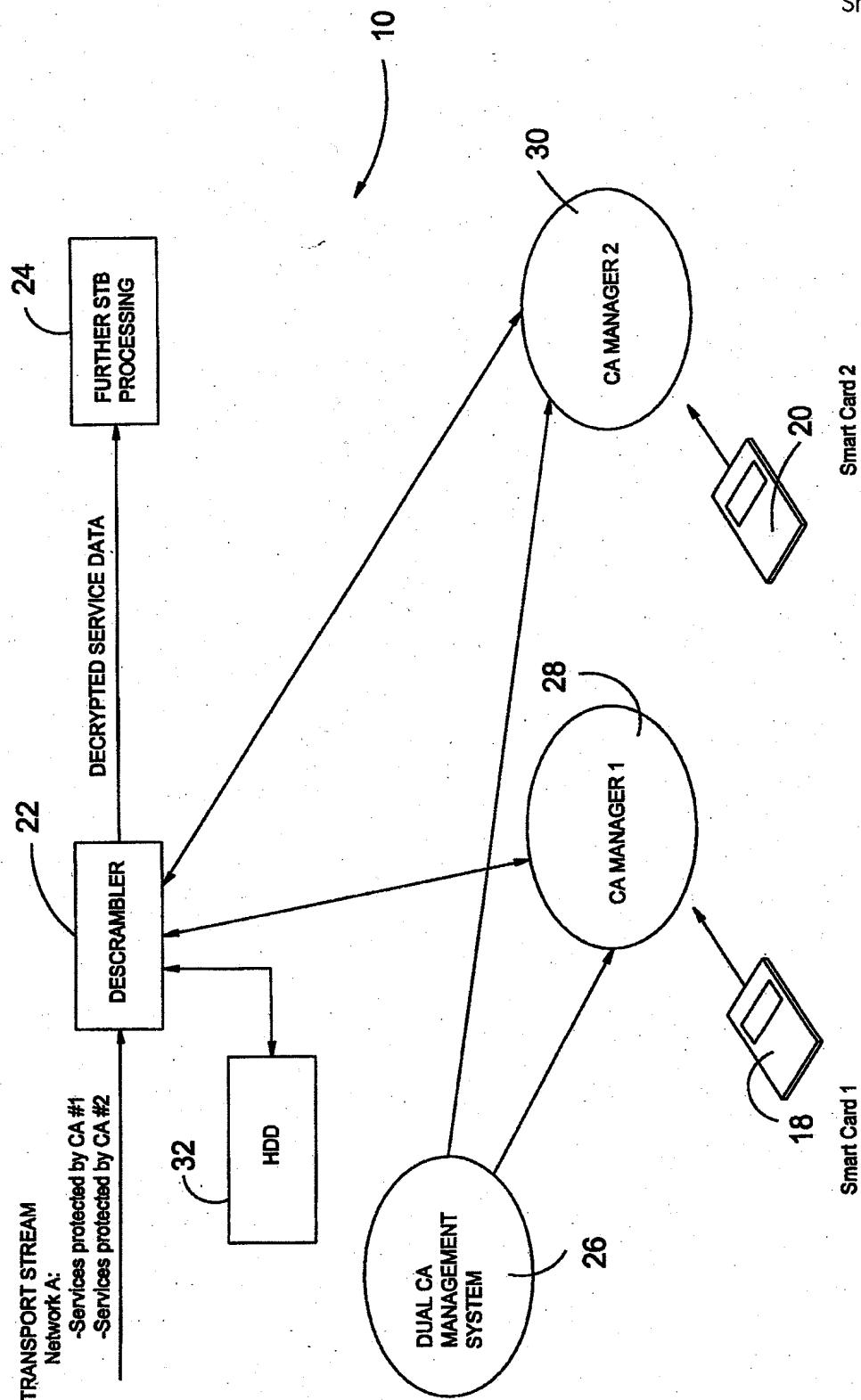


FIGURE 4